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Improvement of Business Processes – a Research Study in Wood-processing Companies of Slovakia

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Abstract

A strong competition on the wood and furniture market forces enterprises to pay attention not only to quality of products but also to quality and performance of internal business processes. Business process is an object of the process approach to management based on investigating and analysing from the view of business activities and activities carried out by managing staff. The paper deals with issue of the improvement of internal processes in production companies, which is the last part in a life cycle of a process management. The attention is paid to initial conditions and methods for process improvement. The aim of the paper is to summarize theoretical knowledge in the area of improvement of business processes and to analyse how this issue is solved in wood-processing companies of Slovakia. A quantitative research through questionnaires was carried out to achieve the goal. The results of the research showed that process management is implemented mostly in large companies with mass and batch production.

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1. Introduction

The level of processes and their management in the company is important since the effectiveness and efficiency of processes should condition a whole series of business decisions. Process management is becoming part of

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company-wide management and is penetrating into all areas of a company, not only in quality assurance. (Simanová, Gejdoš, 2010) This trend is understandable since it is simpler to manage activities as a continuous flow of work from one employee to another.

Process management presents systems, procedures, methods and tools for sustainable securing maximal performance and continual improvement of business processes with aim to fulfil determined strategic goals. (Sujová, 2013) The contents of process management includes three main phases: process identification, process measurement and process improvement (Závadský, 2005). Experience has shown that using this approach, an organisation may achieve advantages as a result of: the ability to concentrate on the efficiency and effectiveness of processes, increased trust of customers and other interested parties in the adopted methods, lower costs and shorter time whilst using resources effectively, supporting the engagement of people and clearly defining their responsibilities, improved systematic and targeted results. (Sujová, 2015)

The substance of process improvement is to achieve the change increasing process level and performance. Improving business processes is important by increasing corporate performance and competitiveness. Process optimization is oriented especially to increase of value added for customer and company.

According to results of previous researches (Sujová, Simanová 2013, Sujová, 2014), wood processing companies use principles and methods of process management at least. They manage internal processes at the lowest level and are achieving the lowest values of performance in comparison with companies from other industrial sectors. It follows that there exists connection between level of process management and corporate performance. Our interest was to carry out a research in wood-processing companies with aim to find out what attention is paid to process improvement. In this paper selected results of carried out research are presented.

2. Material and Methods

Theoretical knowledge concerning process management conceptions and methods was compiled of several kinds of sources. Information resources have been mostly foreign authors of scientific publications. Among the most important authors with contribution to development of process management theory and practice belong: G. R. Lee and G. B. Dale, H. Fayol, A. Sloan, M. Zairi and D. Sinclair, M. Weske and his business process management system, D. P. Norton and Kaplan and their system Balanced Scorecard, M. Hammer and J. Champy with methodology of business process reengineering. Among domestic authors dealing with process management belong: Gejdos, P. (*Process Quality Management*), Potkany, M. *(Process Outsourcing)*, Sujová, A. *(Business process management),* Svozilová, A. (*Business process Improvement*), Zauskova, A. *(Innovation performance)* and Zavadsky, J. (*Business process performance management*).

The primary quantitative research has been performed through questionnaire. The research subjects were enterprises from wood processing industry (WPI) in Slovakia. The aim of research was to find out the level of implementation of business process management. In the first step a database of enterprises consisting of 300 wood processing companies has been created. The information sources came mostly from the Internet databases and Statistical Bureau. The needed sample size was determined. Within statistical evaluation an acceptable margin of error (confidence interval) was set up on ±10%; proportion of characteristic is unknown so probability of characteristic occurrence was 50%; confidence level was 95%. Statistical formulas were used for counting sample size and the result was 73. By means of Internet applications an on-line questionnaire has been created and distributed to enterprises. Questions include all principles, methods and tools of process management known from theory and scientific publications. Data collection was carried out in the first quarter of 2015 and an on-line database for data collection was created. Number of returned filled in questionnaires was 85. The sample size 85 responses is a representative sample in the research in a confidence interval 9% at a confidence level 95%. Answers in questionnaires were processed and evaluated by chosen mathematical and statistical methods: absolute and relative frequency, descriptive statistics and contingent method.

3. Results and Discussion

3.1. Results of theoretical knowledge study

The aim of improving business processes is a positive change - innovation. It is therefore necessary to care for a process, i.e. it must be continuously improved - *optimised*. (Zaušková, 2012) For a company, this means continuously improving processes. The necessary condition for improving processes is knowledge of data about its *performance, productivity and quality, and the ability to measure changes* (optimisation).

Improving processes cannot take place without previously identifying and measuring business processes. From this, there is a clear relationship between individual parts of the content of process management. Via determined process performance indicators and their target values linked to the indicators of overall company performance, it is possible to monitor processes and initiate their improvement. (Weske, 2012) If faults are identified based on data obtained by measuring and evaluating processes, it is the start of improving processes. Evaluation can also be self-assessment when an employee alone discovers discrepancies with their work performed within a process and takes steps towards its improvement. This principle also corresponds with the theory of "added value" in accordance with which an effective process should be a chain of added values. (Svozilová, A., 2011)

In concepts based on a process approach, two basic approaches were characterised for improving business processes, which were radical rebuilding of business processes (process reengineering) and gradual improvement (optimisation) of processes. (Závadský, 2005) To the best known methods for process improvements belong: Six Sigma, Total Quality Management (TQM), Total productive maintenance (TPM), Total flow management (TFM) Kaizen, Method 5S, ISO standards, Benchmarking, Process controlling. (Sujová, 2013). TQM (Total Quality Management) is a managing system oriented to quality, this term is closely related with TPM (Total Productive Maintenance), Lean Management, KAIZEN and ISO standards. (Sujová, Marcineková, 2015)

Basic types of impulses to process improvement can be summarized as follows: results of process measurement in time or according to business cases, process simulation, change of product, strategy, goals, financial analysis, internal or external audit, suggestion of employee, customer and supplier. (Mateides, 2006)

3.2. Results of the primary quantitative research

In this part of paper will be presented selected research results concerning process improvement in investigated wood processing enterprises. The achieved results are processed by contingent analysis.

Structure of the research sample shows that most of enterprises are with job-work (57, 6 %) and small-lot (18, 8) type of production. As for enterprise size, micro enterprises present 37,7%, small sized enterprises 38,8 % where 23, 5% are enterprises with 11-20 employees, middle sized 17, 6 % and large companies 5, 9% of the research sample.

Answers to question concerning steps or activities by managing internal processes showed how many and what companies of WPI improve their processes. Achieved results were analysed according to type of production (see Table 1) and according to enterprise size (see Figure 1).

Table 1. Steps by managing internal processes according to type of production in relative frequency

Activity x type of production (in %)	Mass	Batch	Small-lot	Job-work	WPI total
Process identification	28,6	46,2	18,8	10,6	20
Process visioning	28,6	15,4	12,5	19,1	17,6
Process measurement	42,9	69,2	37,5	17	31,8
Process evaluation	57,1	69,2	68,8	40,4	50,6
Process improvement	71,4	69,2	56,3	36,2	49,4
Not managing processes	0	0	18,8	36,2	23,5
Total	228,6	269,2	212,7	159,5	192,9

Data in Table 1 show that companies carry out more than one step, mostly evaluation and improvement of processes, however 23, 5% don´t manage their processes. All enterprises with mass and batch type of production and more than half of small-lot production improve their processes. The worst results are in companies with job-work type of production, 36% of them don´t manage processes and only 36% improve their processes.

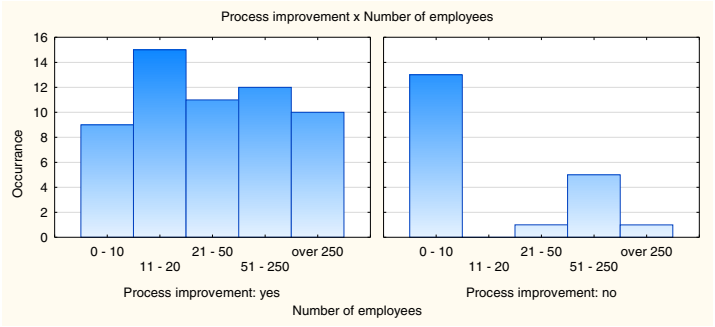

Fig.1. Process improvement according to enterprise size in absolute frequency

In Figure 1, displaying absolute frequency, can be seen that all small enterprises with 11-20 employees. Most of small enterprises with 20-50 employees and also large companies improve their processes, only one enterprise from both sizes doesn´t do it. More than half of micro enterprises don´t improve processes. An interesting finding is that 30% of middle sized companies don´t improve internal processes.

In the next question impulses for process improvement were investigated. Results of percentage frequency are shown in Table 2.

Table 2. Impulses for process improvement according to type of production in relative frequency

Impulse + Type of production (in %)	Mass	Batch	Small-lot	Job-work	WPI total
Results of process measuring in time	57,1	46,2	37,5	14,9	28,2
Results of process measuring after business cases	42,9	30,8	37,5	12,8	23,5
Process simulation	0	7,7	0	4,3	3,5
Product change	14,3	7,7	31,3	17	17,6
Strategy change	0	7,7	0	14,9	10,6
Change of goals	0	7,7	12,5	4,3	7,1
Financial analysis	28,6	61,5	56,3	36,2	44,7
Audit	28,6	30,8	0	0	7,1
Suggestion of employee	42,9	69,2	37,5	48,9	49,4
Suggestion of customer	85,7	84,6	75	57,4	67,1
Suggestion of supplier	14,3	23,1	25	17	20
Total	314,4	377	318,9	242,6	288,2

Achieved results showed that in all enterprises and in all types of production the main impulse for process improvement a suggestion of customer is. Next impulses appearing in half of investigated enterprises are: suggestion of employee and financial analysis. In batch production are often used also following impulses: results of process measurement in time (57, 1%), results of process measurement according to business cases (42, 9%) and suggestion of employee (42, 9%). On the basis of suggestion from employee, processes are often improved in enterprises with batch production (69, 2%) and in enterprises with job-work production (48, 9%). Larger number of enterprises with batch production (61, 5%) and small-lot production (56, 3%) consider a financial analysis to be an impulse for process improvement.

Answers to question concerning the use of methods of process improvement brought following findings according to type of production (see Table 3) and according to company size (see Figure 2).

Results in table 3 show that companies of WPI have implemented standards ISO connected with process controlling the most especially company with mass and batch type of production. In 40% companies with small-lot and job-wok production is no method implemented and in the rest of them mostly only one method is used. Modern methods are implemented in low rate. Except process controlling, companies use TQM (with job work and batch production), Kaizen, Lean production and 5S method (mostly in mass and batch production).

Table 3. Methods by improving processes according to type of production in relative frequency

Method x Type of production (in %)	Mass	Batch	Small-lot	Job-work	WPI total
standards ISO 9000 + next	57,1	61,5	18,8	12,8	25,9
Six Sigma	14,3	7,7	0	0	2,4
Process controlling	14,3	23,1	18,8	8,5	14,1
TQM	0	7,7	0	10,6	7,1
TPM	14,3	15,4	0	2,1	4,7
Kaizen	14,3	15,4	18,8	2,1	8,2
TFM	0	15,4	0	2,1	3,5
Reengineering	14,3	0	0	2,1	2,4
Lean production	14,3	7,7	6,3	8,5	8,2
Benchmarking	14,3	7,7	0	2,1	4,7
5S method	28,6	15,4	0	2,1	5,9
No method	0	15,4	43,8	38,3	31,8
Total	185,8	177	62,7	53	87,1

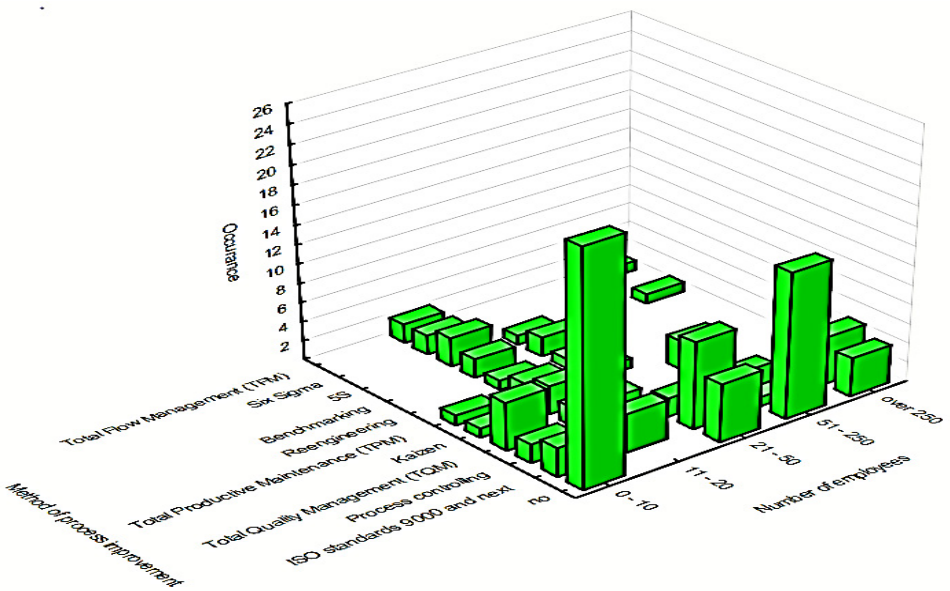

Fig.2. Methods of process improvement according to enterprise size in absolute frequency

Achieved results concerning used methods of process improvement according to enterprise size showed that almost all small sized enterprises use more methods, mostly ISO standards, process controlling, benchmarking and 5S method. All methods are present in small enterprises with 11-20 employees. Larger number of micro and middle sized enterprises don´t use any method. In micro enterprises are implemented TQM, ISO standards, process controlling, Kaizen and TPM. Part of middle sized companies use Kaizen, ISO standards and process controlling. Large sized companies have implemented only ISO standards and process controlling.

Following table 4 shows results of absolute frequency by relation between improving processes and used methods in investigated companies. The results showed that 21 enterprises presenting 25 % of sample size improve processes but don´t use any mentioned method. Only one enterprise from group without process management has implemented one method - ISO standards.

Table 4. Relation between process improvement and used methods in absolute frequency

Process improvement	no	ISO standards 9000 and next	Process controlling	Total Quality Management (TQM)	Kaizen	Total Productive Maintenance (TPM)	Reengineering	Benchmarking	5S	Six Sigma	Total Flow Management (TFM)
yes	21	14	5	2	4	2	0	2	3	1	3
no	19	1	0	0	0	0	0	0	0	0	0
Total	40	15	5	2	4	2	0	2	3	1	3

Source: own processing in software Statistics

The last question in questionnaire research was focused on satisfaction with using methods of process improvement. Each method was evaluated by points in following scale: very satisfied – 5 p., satisfied – 4 p., averaged satisfied – 3 p., unsatisfied – 2 p., very unsatisfied – 1 p. Results of absolute frequency (AF) and percentage frequency (PF) are shown in table 5.

Table 5. Satisfaction with used methods by process improvement in absolute and relative frequency

Method / Satisfaction	VS (5)		S (4)		AS (3)		US (2)		VUS (1)		Average satisfaction
	AF	PF	AF	PF	AF	PF	AF	PF	AF	PF	
standards ISO 9000 and next	3	3,5	14	16,5	9	10,6	0	0	0	0	3,8
Six Sigma	0	0	3	3,5	1	1,2	0	0	0	0	3,8
Process controlling	1	1,2	7	8,2	9	10,6	2	2,4	0	0	3,4
TQM	1	1,2	2	2,4	0	0	0	0	1	1,2	3,5
TPM	0	0	1	1,2	2	2,4	1	1,2	1	1,2	2,6
Kaizen	1	1,2	2	2,4	5	5,9	0	0	0	0	3,5
TFM	1	1,2	1	1,2	2	2,4	0	0	0	0	3,8
Reengineering	0	0	2	2,4	0	0	2	2,4	1	1,2	2,6
Lean production	1	1,2	4	4,7	3	3,5	1	1,2	1	1,2	3,3
Benchmarking	1	1,2	4	4,7	3	3,5	1	1,2	0	0	3,6
5S method	1	1,2	5	5,9	2	2,4	0	0	0	0	3,9

Looking at the average satisfaction it can be concluded that companies are satisfied with method 5S the most and satisfaction was found out also by methods TFM, Six Sigma, and ISO standards. Companies are unsatisfied with using TPM and reengineering.

4. Conclusion

Improving processes means carrying out positive changes which increase the performance of a process. The basis for improving a process is stating the target values of key performance indicators of a process and their comparison with actually achieved values ascertained when measuring and analysing a process.

Most of investigated wood-processing enterprises in our research are small sized (76, 5 %) and dominative type of production is job-work and small-lot in 74, 1 % enterprises. In carried out research study 23, 5 % of wood processing enterprises in Slovakia don´t manage processes at all. According to enterprise size this answer marked mainly micro enterprises and according to type of production there were mainly enterprises with job-work production. 32 % of investigated enterprise don´t improve internal processes and don´t use any method. It means that almost 10 % of enterprises monitor business processes but don´t pay attention to their improvement.

Achieved results lead to conclusion that the marked attention to process improvement is paid in small sized enterprises with 11-20 employees and in enterprises with batch and small-lot type of production. All small sized enterprises with more than 10 employees and batch production improve business processes by using more than one method. Negative results were achieved in middle sized enterprises with small-lot production where almost all of them don´t improve internal processes. Maximum orientation to customer can be seen in enterprises with job-work and small-lot type of production and that is why these enterprises should pay maximum attention to improvement of internal processes. Our next research will be focused on reasons why middle sized and small-lot production enterprises don´t improve processes and don´t have implemented modern methods for process improvement. Our aim is to increase implementation of process management methods and principles in mentioned group of enterprises.

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References

Dobrovič, J. 2014. Trends in management development during the reform of the tax administration of the Slovak republic. International journal of accounting and taxation , 2(1):609-630

Ďurisova, M., Kucharčíková, A. 2014. *The Quantitative expression of Factors which Affect the Cost of Transport Enterprise*. In Transport means 2014: proceedings of the 18th International conference, October 23-24, 2014, Kaunas University of Technology Lithuania, p. 190-193.

Mateides, A. et al. 2006. Manažérstvo kvality: história, koncepty, metódy. Bratislava: Elita

Potkány, M. 2008. Personnel outsourcing processes. E+M Economics and management. 11(4): 53-61.

Potkány, M. 2015. Coordinated Management Model of Support Business Processes through Facility Management. Procedia Economics and Finance, 23:396 – 401.

Simanová, L., Gejdoš, P. 2010. *The quality evaluation of process in furniture manufacture*. In Process Innovation. Dnitropetrovsk: Yurii V. Makovetsky. P. 32-45

Sujova, A., Simanova, L. 2013. *Meranie a riadenie interných procesov*. In Meranie a riadenie výkonnosti podnikov. Zvolen: TU Zvolen, p. 172-220.

Sujova, A. 2013.*Business Process Performance Management – a Modern Approach to Corporate Performance Management.* In: Liberec Economic Forum. Liberec: TU Liberec, p. 542-550.

Sujová, A., Rajnoha, R., Merková, M. 2014. Business Process Performance Management Principles Used in Slovak Enterprises. Procedia-Social and Behavioral Sciences, 109: 276 - 280.

Sujová, A., Marcineková, K. 2015. Modern Methods of Process Management Used in Slovak Enterprises. In: Procedia-Economics and Finance, 23: 889 – 893.

Svozilová, A. 2011. Zlepšování podnikových procesů. První vydání. Praha: Grada Publishing, a.s.

Weske, M. 2012. *Business Process Management.2nd edition.*.Springer – Verlag Berlin Heidelberg. pp. 403.

Zauskova, A, Domova, A. 2012. *Inovačná výkonnosť a inovatívnosť podnikateľských subjektov*. Trnava: UCM Trnava, pp. 128.

Zauskova, A., Miklencicova, R., Madlenak, A., Bezakova, Z., Mendelova, D. 2013. Environmental Protection and Sustainable Development in the Slovak Republic. European Journal of Science and Theology, 9(6): 153 - 154

Závadský, J. 2005. *Riadenie výkonnosti podnikových procesov.* Banská Bystrica: Univerzita Mateja Bela, Ekonomická fakulta, pp. 120